

# Muscle

## Chapter 17b

- I. Background
  - A. muscle fibers
  - B. Prefixes
    - 1. Myo, Mys, Sarco
  - C. Types
    - 1. Skeletal
    - 2. Cardiac
    - 3. Smooth
- II. Microscopic Anatomy
  - A. Muscle fiber
    - 1. sarcolemma
    - 2. sarcoplasm
    - 3. myofibrils
  - B. Bands
    - 1. Major bands
    - 2. I band
      - 1) Z disc
      - a) sarcomere
    - 3. A band
      - 1) H zone
      - 2) M line
  - C. Molecular Level
    - 1. Myosin
      - 1) head
      - 2) tail
      - 3) myosin filament
    - 2. Actin
      - a. tropomyosin
        - 1) troponin
      - b. Band formation
  - D. Additional structures
    - 1. Sarcoplasmic Reticulum
      - a. terminal cisternae
    - 2. T Tubules
    - 3. Triad
- III. Contraction = Sliding Filament Mechanism
  - A. Activation
    - 1. motor neuron
    - 2. neuromuscular junction
      - a. synaptic cleft acetylcholine (ACh)
        - 1) ACh receptors
  - B. Muscle translation
    - 1. polarized
    - 2. depolarizes
  - C. Muscle Contraction at the molecular level
    - 1. overall
    - 2. myosin heads
      - a. *attach*
        - 1) cross bridges
      - b. *pivot*
      - c. *pull*
        - 1) working (power) stroke
      - d. release
        - 1) cross bridge detachment

- e. cock
- 3. Notes
- D. Relaxation
- IV. Energy Specializations
  - A. glycogen
  - B. myoglobin
  - C. creatine phosphate (phosphocreatine) (CrP)
- V. Smooth Muscle
  - A. Background
  - B. Microscopic structure
    - 1. Organization
      - 1) peristalsis
    - 2. Protein
      - a. Myosin filaments
      - b. Actin
      - c. Intermediate filaments
      - d. Dense bodies
  - C. Contraction
    - a. calmodulin
    - b. myosin light chain kinase